

REMARKS

This Amendment is submitted in response to the Office Action dated February 2, 2005. In the Office Action, the Patent Office rejected Claims 18-20 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 3,703,682 to *Wickerman et al.*; and rejected Claims 9-12 and 14-16 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,484,620 to *Arshad et al.* Further, the Patent Office rejected Claim 13 under 35 U.S.C. §103(a) as being unpatentable over *Arshad et al.*; and rejected Claim 17 under 35 U.S.C. §103(a) as being unpatentable over *Arshad et al.* in view of U.S. Statutory Registration No. H277 to *Lee et al.* Moreover, the Patent Office rejected Claims 1-7 and 18-21 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 1-10 and 17-22 of U.S. Patent No. 6,952,009 to *Engstrand*.

Applicant notes with appreciation that the Patent Office indicated that Claim 21 would be allowable if rewritten in independent form. Accordingly, Applicant added Claim 22 which incorporates the limitations of Claim 21 and Claim 18 from which Claim 21 depends.

Further, Applicant notes with appreciation that the Patent Office indicated that Claims 1-7 would be allowable after the double patenting rejection is overcome. Furthermore, Applicant

amended Claim 1 to overcome the double patenting rejection and to place Claims 1-7 in allowable form.

By the present Amendment, Applicant amended Claims 1, 9, 10, 12 and 18 and added new Claim 22. Applicant asserts that the amendments to the claims and the remarks that follow overcome the rejections made by the Patent Office and place the application in condition for allowance. Notice to that effect is requested.

In the Office Action, the Patent Office rejected Claims 18-20 under 35 U.S.C. §102(b) as being anticipated by *Wickman et al.* More specifically, the Patent Office alleges that:

Regarding claims 18-20, *Wickman et al.* disclose (see Figs. 1 and 2) a method for measuring a position within a cylinder (11, 49) having walls defining an interior (towards a center of cylinder) wherein the cylinder has an interior surface (inner) and an exterior surface (outer) wherein the cylinder has an aperture (at 15) within one of the walls and further wherein the cylinder has a head (47) within the interior wherein the head is movable within the interior of the cylinder, comprising the steps of: directing light (from 21) into the interior of the cylinder through the aperture; attaching a light sensor (27) to the interior surface of the cylinder wherein the light sensor extends inward (width of sensor) with respect to the interior of the cylinder; detecting (with 27) an amount of light in the interior of the cylinder which is not absorbed by the interior surface and the head of the cylinder wherein the light sensor detect the amount of light; and determining a position of the head in the interior of the cylinder wherein the position of the head corresponds to the amount of light detected by the light sensor (see Fig. 3).

Independent Claim 18, as amended, requires a method having a head which is movable within the interior of the cylinder from the first wall to the second wall. Claim 18 requires the step of

attaching a light sensor to the interior surface of the cylinder at the second wall wherein the light sensor is located within the interior of the cylinder wherein the head is located between the aperture and the light sensor. Moreover, Claim 18 requires the step of detecting an amount of the light in the interior of the cylinder at the second wall which is not absorbed by the interior surface and the head of the cylinder wherein the light sensor detects the amount of light received from the aperture in the first wall.

Wickman et al. merely disclose a gradiometer which has two magnetometers axially spaced apart by an internally non-reflecting tube. One magnetometer is attached to a light source fixed centrally of a photo-multiplier array at one end of the tube. The source transmits collimated or co-phasal light to the other end of the tube wherein the light is reflected by a mirror mounted on a two axis gimbal. The other magnetometer is attached to the gimbal.

Nowhere does *Wickman et al.* teach or suggest a method having a head which is movable within the interior of the cylinder from the first wall to the second wall as required by Claim 18. Further, nowhere does *Wickman et al.* teach or suggest the step of attaching a light sensor to the interior surface of the cylinder at the second wall wherein the light sensor is located within the interior of the cylinder wherein the head is located between the aperture and the light sensor as required by Claim 18. Moreover,

nowhere does *Wickman et al.* teach or suggest the step of detecting an amount of the light in the interior of the cylinder at the second wall which is not absorbed by the interior surface and the head of the cylinder wherein the light sensor detects the amount of light received from the aperture in the first wall as required by Claim 18.

Wickman et al. merely disclose "the reflector unit 31 comprises a two-axis gimbal 35 having its outer signal 37 mounted for rotation about a Y axis and an inner gimbal 39 mounted for rotation about an X axis perpendicular to Y axis." Further, *Wickman et al.* disclose "a second magnetometer 41 is attached to the inner gimbal 39 for rotation therewith."

Under 35 U.S.C. §102(b), anticipation requires that a single reference discloses each and every element of Applicant's claimed invention. *Akzo N.V. v. U.S. International Trade Commission*, 808 F.2d 1471, 1479, 1 USPQ 2d 1241, 1245 (Fed. Cir. 1986). Moreover, anticipation is not shown even if the differences between the claims and the reference are "insubstantial", and one skilled in the art could supply the missing elements. *Structure Rubber Products Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 USPQ 1264, 1270 (Fed. Cir. 1984).

Since *Wickman et al.* fail to disclose the steps specifically defined in amended independent Claim 18, Applicant asserts that the

rejection of Claims 18-20 under 35 U.S.C. §102(b) has been overcome and should be withdrawn. Notice to that effect is requested.

In the Office Action, the Patent Office rejected Claims 9-12 and 14-16 under 35 U.S.C. §102(e) as being anticipated by *Arshad et al.* More specifically, the Patent Office alleges that:

Regarding claims 9-12 and 14-16, *Arshad et al.* disclose (see Fig. 1) a system for monitoring position, comprising: a cylinder and wherein the shaft is moveable within the interior of the cylinder and further wherein the cylinder has an aperture (at 17 as applied to claim 10; at 46 as applied to claims 14 and 15) in the first wall adjacent to the shaft; and a sensor (combined 48, 40) within the interior of the cylinder wherein the sensor detects an amount of light within the cylinder which is not absorbed by the shaft and further wherein the amount of light detected by the sensor corresponds to a position of the shaft within the interior of the cylinder.

Independent Claim 9, as amended, requires a system having the cylinder which has an aperture in the first wall adjacent to the shaft wherein light is continuously projected into the interior of the cylinder via the aperture. Moreover, Claim 9 requires a sensor on a second wall of the cylinder wherein the first wall is opposite to the second wall of the cylinder wherein the sensor is located within the interior of the cylinder wherein the sensor extends inward from the second wall to the interior of the cylinder wherein the sensor detects an amount of light within the cylinder at the second wall which is not absorbed by the shaft and further.

Arshad et al. merely disclose a hydraulic actuator which has a cylinder with a piston that is moved by hydraulic fluid. A light

guide in one end of the cylinder directs a laser beam into the cylinder and off the piston where the beam is reflected. The beam then exits the cylinder through a second light guide. A control unit measures the time of flight of the laser beam and calculates the piston position.

Nowhere do *Arshad et al.* teach or suggest a cylinder which has an aperture in the first wall adjacent to the shaft wherein light is continuously projected into the interior of the cylinder via the aperture as required by Claim 9. Further, nowhere do *Arshad et al.* teach or suggest a sensor on a second wall of the cylinder wherein the first wall is opposite to the second wall of the cylinder wherein the sensor is within the interior of the cylinder wherein the sensor extends inward from the second wall to the interior of the cylinder wherein the sensor detects an amount of light within the cylinder at the second wall as required by Claim 9.

On the contrary, *Arshad et al.* merely disclose that a "laser beam 44 is made of a series of pulses of light generated by the laser diodes." Further, *Arshad et al.* disclose that "optical couplers 46 and 48 are disposed such that laser beam 44 travels through cylinder 12 in a direction substantially parallel to the longitudinal axis 45 of the cylinder." Moreover, *Arshad et al.* disclose that "the light impinges upon reflective surface portion 26, bounces back to reflective surface 51, returns to reflective surface portion 27 on the piston and bounces off that surface to

ultimately impinge upon the one or more photo diodes that make up photo diode array 40.

Under 35 U.S.C. §102, anticipation requires that a single reference discloses each and every element of Applicant's claimed invention. *Akzo N.V. v. U.S. International Trade Commission*, 808 F.2d 1471, 1479, 1 USPQ 2d. 1241, 1245 (Fed. Cir. 1986). Moreover, anticipation is not shown even if the differences between the claims and the reference are "insubstantial", and one skilled in the art could supply the missing elements. *Structure Rubber Products Co. v. Park Rubber Co.*, 749 F.2d. 707, 716, 223 USPQ 1264, 1270 (Fed. Cir. 1984).

Since *Arshad et al.* fail to disclose the elements specifically defined in amended independent Claim 9, Applicant asserts that the rejection of Claims 9-12 and 14-16 under 35 U.S.C. §102(e) has been overcome and should be withdrawn. Notice to that effect is requested.

In the Office Action, the Patent Office rejected Claims 1-7 and 18-21 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 1-10 and 17-22 of *Engstrand*. More specifically, the Patent Office asserts that:

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '009 patent claim: a cylinder, a first wall, a shaft, a second wall, a sensor on the second wall and measuring a position. The '009 patent claim: a cylinder, a first wall, a shaft, a second wall, a sensor on the second wall and measuring a position. The '009 patent does not claim an aperture or an aperture wherein

light projects through the aperture into the cylinder. However, simply translating the light projects through the aperture into the cylinder. However, simply translating the light source of the '009 patent from on or within the cylinder to an external configuration is well known and would require only routine skill in the art.

Independent Claim 1, as amended, requires a sensor at the second wall of the cylinder wherein the sensor detects intensity of light within the interior of the cylinder at the second end of the cylinder which is not absorbed by the shaft and the interior of the cylinder wherein the intensity of light detected by the sensor at the second wall corresponds to a position of the shaft in the interior of the cylinder.

As set forth above, independent Claim 18 requires the step of attaching a light sensor to the interior surface of the cylinder at the second wall wherein the light sensor is located within the interior of the cylinder wherein the head is located between the aperture and the light sensor. Moreover, Claim 18 requires the step of detecting an amount of the light in the interior of the cylinder at the second wall which is not absorbed by the interior surface and the head of the cylinder wherein the light sensor detects the amount of light received from the aperture in the first wall.

Independent Claim 1 of *Engstrand* requires an apparatus which has a light source on the first wall of the machine element wherein the light source extends inward with respect to the interior of the

machine element wherein the light source emits a light into the interior of the machine element. Moreover, Claim 1 of *Engstrand* requires a sensor positioned on the first wall of the machine element wherein the sensor detects intensity of emitted light within the interior of the machine element which is not absorbed by the coating on the interior surface of the machine element wherein the intensity of light corresponds to a position of the head element within the machine element at a point between the first end and the second end.

Independent Claim 18 of *Engstrand* requires a method having the steps of attaching a light source to the machine element at the first wall wherein the light source emits light into the interior of the machine element wherein the first wall is planar and attaching a sensor to the machine element at the first wall wherein the shaft element is located between the sensor and the light source. Moreover, Claim 18 of *Engstrand* requires the step of measuring intensity of emitted light which is not absorbed by the coating on the interior surface of the machine element wherein the intensity of emitted light is detected by the sensor.

Nowhere do Claims 1-10 and 18-21 of *Engstrand* teach or suggest a sensor at the second wall of the cylinder wherein the sensor detects intensity of light within the interior of the cylinder at the second end of the cylinder which is not absorbed by the shaft and the interior of the cylinder wherein the intensity of light detected by the sensor at the second wall corresponds to a position

of the shaft in the interior of the cylinder as required by Claim 1 of the present application. Nowhere do Claims 1-10 and 18-21 of *Engstrand* teach or suggest attaching a light sensor to the interior surface of the cylinder at the second wall wherein the light sensor is located within the interior of the cylinder wherein the head is located between the aperture and the light sensor as required by Claim 18 of the present invention. Moreover, nowhere do Claims 1-10 and 18-21 of *Engstrand* teach or suggest the step of detecting an amount of the light in the interior of the cylinder at the second wall which is not absorbed by the interior surface and the head of the cylinder wherein the light sensor detects the amount of light received from the aperture in the first wall as required by Claim 18 of the present invention.

A double patenting rejection of the obviousness-type is "analogous to [a failure to meet] the nonobviousness requirement of 35 U.S.C §103" except that the patent principally underlying the double patenting rejection is not considered prior art. In re Braithwaite, 379 F.2d 594, 154 USPQ (CCPA 1967). Therefore, any analysis employed in an obviousness-type double patenting rejection parallels the guidelines for analysis of a 35 U.S.C. §103 obviousness determination. In re Braat, 937 F.2d 589, 19 USPQ2d 1289 (Fed. Cir. 1991). It is important to note that, in performing this obviousness analysis, it is the issued patent claim itself, and not the disclosure of the issued patent in general, that may be used by the examiner as a basis for comparison in an obviousness-

type double patenting rejection. In re Bartfeld, 925 F.2d 1450, 1453, (Fed. Cir. 1991).

In view of the foregoing remarks and amendments, Applicant respectfully submits that the rejection of Claims 1-7 and 18-21 on the ground of nonstatutory obviousness-type double patenting over Claims 1-10 and 17-22 of *Engstrand* has been overcome and should be withdrawn. Notice to that effect is requested.

With respect to the rejection of Claim 13 under 35 U.S.C. §103(a) as being unpatentable over *Arshad et al.*, Applicant respectfully submits that the rejection has been overcome by the amendment to independent Claim 9 and for the reasons that follow.

In the Office Action, the Patent Office alleged that:

Regarding Claim 13, *Arshad et al.* disclose the claimed invention as set forth above. *Arshad et al.* do not specifically disclose a second shaft as claimed. However, choosing to provide a second shaft for additional support is a matter of design choice and requires only routine skill in the art.

However, Claim 13 requires a second shaft within the cylinder wherein the second shaft is movable within the cylinder. *Arshad et al.* fail to teach or to suggest the novel structural elements of the present invention as required by amended independent Claim 9 from which Claim 13 depends. Accordingly, the rejection of Claim 13 under 35 U.S.C. §103(a) has been overcome and should be withdrawn. Notice to that effect is requested.

With respect to the rejection of Claim 17 under 35 U.S.C. §103(a) as being unpatentable over *Arshad et al.* in view of *Lee et*

al., Applicant respectfully submits that the rejection has been overcome by the amendment to independent Claim 9 and for the reasons that follow.

In the Office Action, the Patent Office alleged that:

Regarding Claim 17, Arshad et al. disclose the claimed invention as set forth above. Arshad et al. do not specifically disclose a light absorbing coating on the shaft as claimed. Lee et al. teach (see Fig. 2) a coating on a shaft for absorbing light.

However, Claim 17 requires a coating on the shaft wherein the coating absorbs light. Lee et al. fail to teach or to suggest the novel structural elements of the present invention which are not taught by Arshad et al., taken singly or in combination, as required by amended independent Claim 9 from which Claim 17 depends. Accordingly, the rejection of Claim 9 under 35 U.S.C. §103(a) has been overcome and should be withdrawn. Notice to that effect is requested.

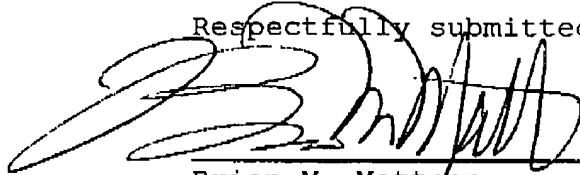
Claims 2-7 depend from Claim 1; Claims 10-17 depend from Claim 9; and Claim 19-21 depend from Claim 18. These claims are further believed allowable over the references of record since each sets forth additional structural elements and novel steps of Applicant's apparatus, system and method, respectively.

In view of the foregoing remarks and amendments, Applicant respectfully submits that all of the claims in the application are in allowable form and that the application is now in condition for allowance. Further, Applicant submits that neither further search

nor consideration would be necessitated by entry of this Amendment; therefore, entry of this Amendment is proper and should be effected.

If any outstanding issues remain, Applicant urges the Patent Office to telephone Applicant's attorney so that the same may be resolved and the application expedited to issue. Applicant requests the Patent Office to indicate all claims as allowable and to pass the application to issue.

Respectfully submitted,

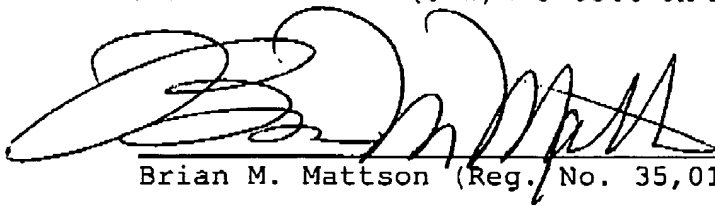


(Reg. No. 35,018)

Brian M. Mattson
ATTORNEY FOR APPLICANT
Patents+TMS
A Professional Corporation
2849 W. Armitage Ave.
Chicago, Illinois 60647
Telephone: (773) 772-6009

CERTIFICATE OF TRANSMISSION

I hereby certify that this **Amendment After Final and Transmittal Letter** are being transmitted via telefax (571)273-8300 on March 30, 2006.



Brian M. Mattson (Reg. No. 35,018)